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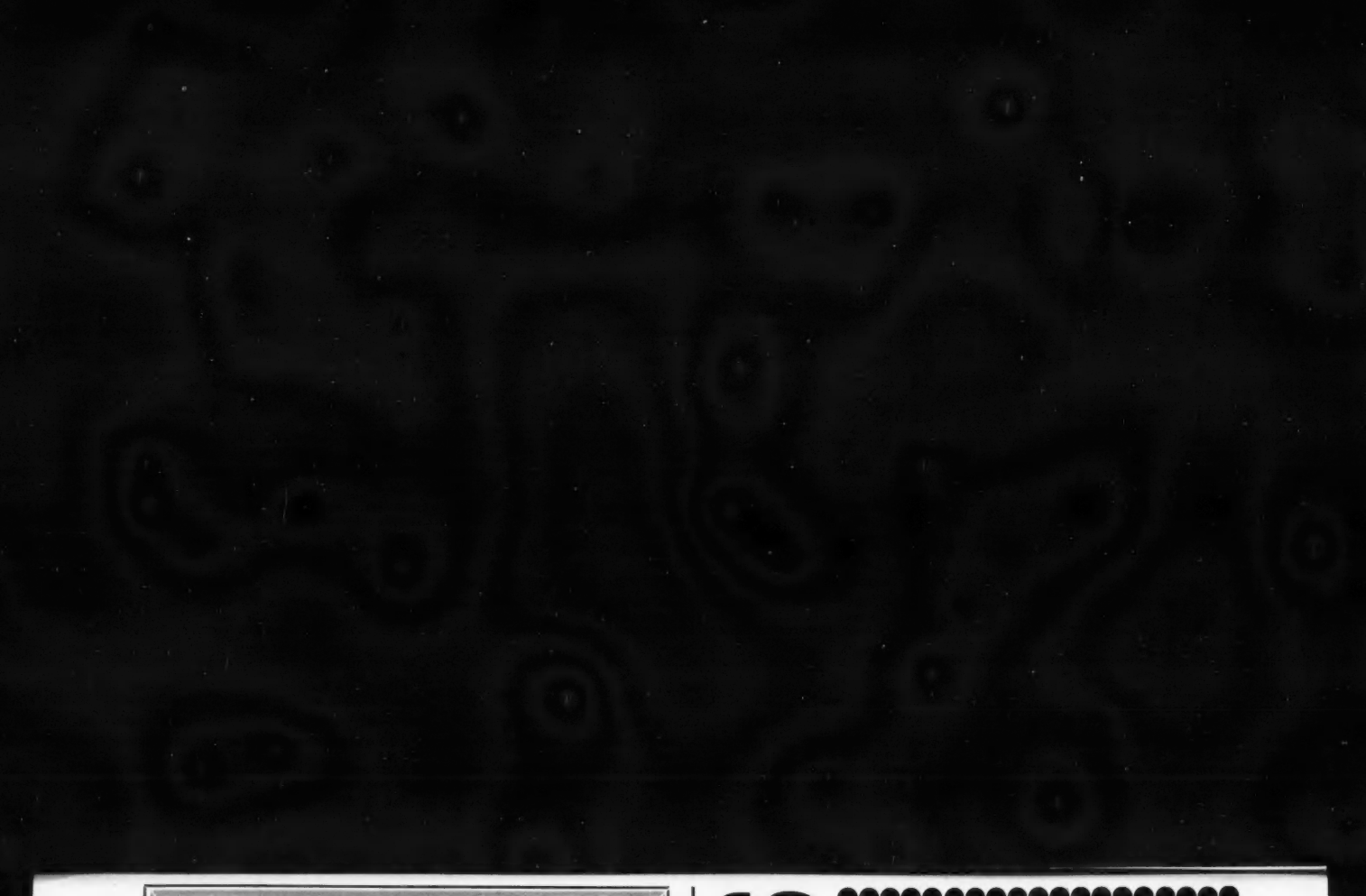
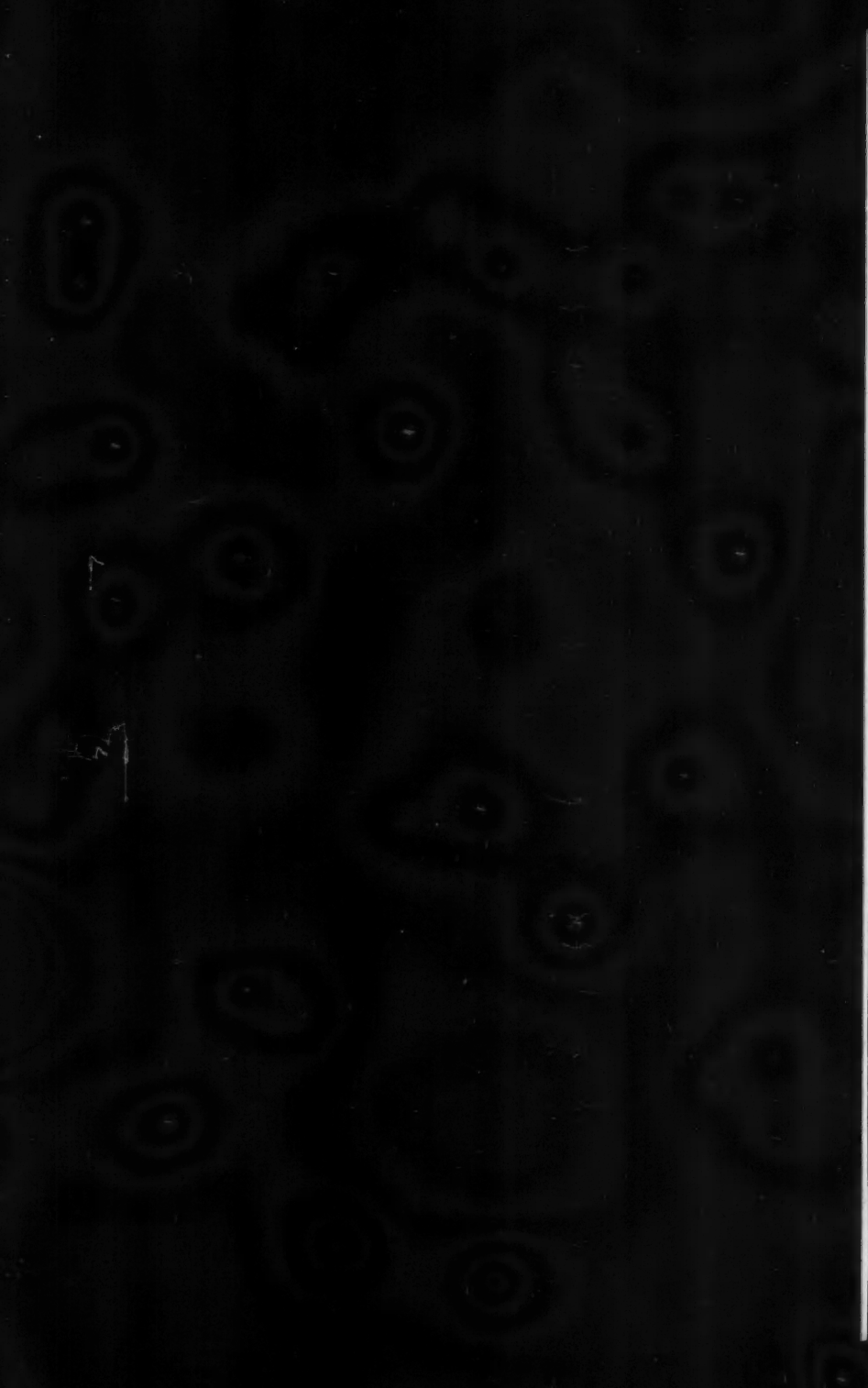
THE CHEMICAL AGE

VOL LVII 6 SEPTEMBER 1947 No 1469





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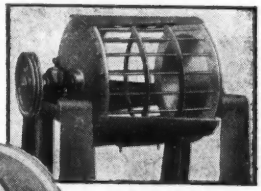

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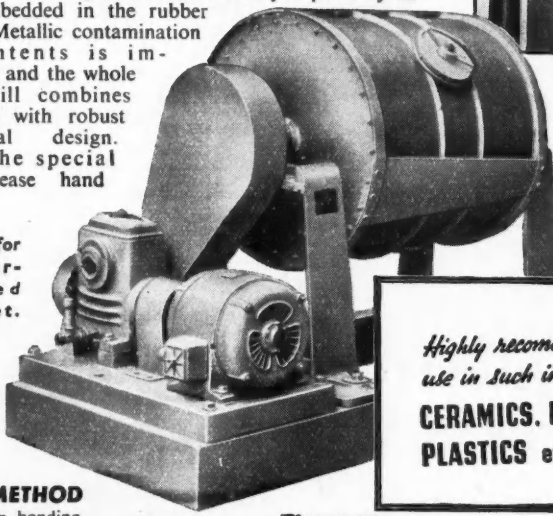

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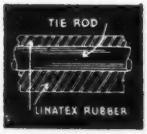

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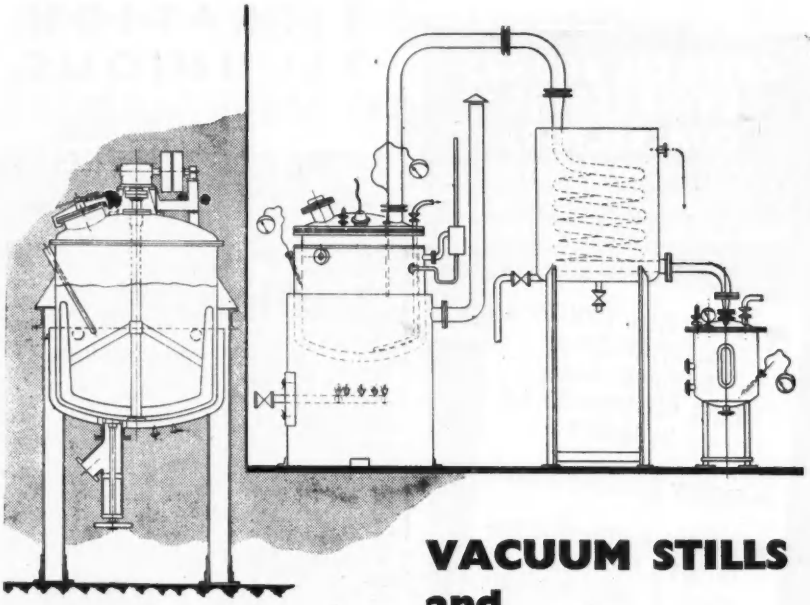

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VOL. LVII No. 1469. 6 September 1947 Annual Subscription 26s. 8d. per copy; post free, 10d.

The Pretensions of Labour

THE social history of our times reveals a change over the past 150 years that will surely delight and interest historians of centuries yet to come. It is rooted deep in human nature. Man is a dominating animal; he is naturally lazy and dislikes exertion. In earlier days, he solved the problem of living without hard work by the institution of slavery. Captives taken in battle or by raids into other districts or other countries were put to work without pay and with hard and often cruel task-masters to see that such keep as they received was fully earned. We do not seem to have changed greatly, for we, the British, still retain German captives in our midst, without asking whether they wish to return home or no. That being so, we can hardly cast scorn upon the Victorians or the Americans for their treatment of the submerged classes. American slavery has ended but it is only necessary to read any American paper that deals with social conditions to know that its aftermath is still present in the undoubted difficulties of a community of men of different colours. The Victorians in Britain treated their workpeople nearly as badly—sometimes worse. Those unfortunate folk were equally slaves, slaves of their need to keep themselves alive by earning sufficient to buy the bare necessities of life. The women who toiled half-naked in our coalmines, the children of tender age tied to looms for 15 hours a day and made to keep awake by the overseer's lash, were manifestations of a disregard of human rights at the beginning of the industrial revolution that have left their mark ever since. Reforms came hard, and were bitterly contested by the exploiters and the exploited. Not until 1901, for example, were children under the age of 12 barred from the factory, and factory conditions made reasonably good. Good working conditions came not so much from the good-will of the employer as from the enforcement of regulations by Inspectors appointed for that purpose by the Conservative and Liberal Governments of the day.

These present-day conditions are jealously guarded by those who organise the wage-earners of the country. The circumstances that gave rise to them have long since passed and no employer would wish to see them return. Unfortunately, the wage-earners—we will not describe them as " workers " for obvious reasons—cannot forget the sufferings of their ancestors, and are badly led by those who preach class hatred. We are not a united nation; only war seems to unite us. The situation today seems to be that instead of the employers exploiting their employees as they did generations ago when they (the employers) had the upper hand, free education has now brought about a state of affairs where the employees are ruthlessly determined to exploit their position to work less and play more. It is leadership that has been at fault. Most people in this country have neither the capacity to think deeply nor knowledge of the facts upon which to base conclusions upon major issues. They have been lured by specious promises of 40-hour weeks, or even less, of a paradise of leisure, of control over the businesses that employ them. It is not the fault of the miners that they have secured a five-day week without any

On Other Pages

intention of honouring their side of the bargain; the fault lies with their new leaders who have promised them less work, more pay and impossibly ideal conditions of work. "By the sweat of thy brow shalt thou eat bread," is still as true as it was 2000 years ago.

These pretensions of organised labour have been largely responsible in bringing the country to its present pass. We shall all suffer alike and the experience may teach some much-needed lessons. Already the capacity of labour to govern has been exposed. The pretensions of labour leaders to control great businesses successfully will prove equally hollow. The expressed intention of Trade Unions to press for short working hours has proved just as illusory. Lord Dukeston, a former president of the T.U.C. has admitted that the brief and excessive leisure bestowed on people must be given up. We are all parts of a very composite whole. No part can live and prosper unless all prosper and unless all play their part. The claims of organised labour to preferential treatment must be abandoned; the wage-earner must work as hard as his colleague on the staff. Until we become a united nation by working our way out of our present dire straits we can never know even a modicum of prosperity, nor can we maintain our present moderate standard of living. Some of us may have learned our lesson, but before we can put that learning to good use it will have to be appreciated equally by everyone in the country. Experience will teach us all.

There must always be a division of labour within the country. Some must work with their hands; others must work with their brains. Who does which of these things can depend only on the capacity of the individual. Yet another pretension of labour is that almost anyone can do the brain work. This belief is fostered by certain men who hold high positions in the Trade Union movement, together with the inevitable converse, namely that the well-to-do keep these positions a close preserve for themselves and their families. We draw special attention to a passage in the report of the General Council of the T.U.C. presented to the 79th Annual Conference which opened this week. In its evidence on education for commerce, the T.U.C. suggests reform of the methods of entry into professions: "It is commonly suggested that in many cases the supposedly qualifying examination is, in fact, used as a means of controlling entry to the profession. It may also be asked whether entry to these professions should be exclusively controlled by private institutions. We would suggest that the whole question of means of entry to these professions might well be the subject of further examination."

That is another of the pretensions of labour that should be exposed in all its hollowness. The Trade Unions are private institutions that control entry into trades. According to their claims during the past year, no one may be employed in certain work unless he is not only approved by the trade union concerned, but is a member of it. This closed shop idea should be opposed, attacked and eliminated. But inherent in the T.U.C. report is the suggestion that the "working man" cannot enter the professions because those already in those professions will not allow him to do so. May we not read into it also the next step, which is to claim that

membership of a trade union should entitle a man to be admitted as an M.I.C.E., for example? Is it proposed that while the son of well-to-do parents must pass the examination of the Institution of Chemical Engineers, the leadburner would be entitled to admission on the ground of his practical knowledge?

In all seriousness, it is perfectly true that qualifying examinations are used to control entry to all professions in the limited sense that in order to be acknowledged as belonging to the profession, a man or woman must prove the possession of adequate knowledge of, and training in, the art and science of that profession. Anything less than this would not only discredit the profession but prejudice the best interests of the nation. Few trade union leaders would care to work in a building constructed to the plan of a foreman bricklayer with no knowledge of the principles of architecture. There is only one way into any profession—the hard way. Any profession is open to anyone, whatever his station in life, so long as he possesses the necessary professional qualification. We hope to hear no more of this ridiculous proposal.

NOTES AND COMMENTS

German Industry

THE revised plan for the level of industry in the Anglo-American zones of Germany was published last week. This proposed increase in exports is to help make the zone pay for its own imports and take the burden from the shoulders of British and American taxpayers. The plan includes a big stepping up in the exports of chemicals—42 per cent over that of the plan of March 1946. If chemical production increases in accordance with the Anglo-American plan, much of the German chemical industry will be nearly equal to or exceed its 1936 output. On the whole it will be 98 per cent of that for 1936, but that figure is only 54 per cent of the existing capacity of the plants. It is proposed that basic chemicals which had a value of 270 million marks in 1936 shall be increased to 283 million with a producton just above that of 1936—a 38 per cent increase. Synthetic ammonia which is at its full capacity already has a value of 118 million and a production nearly a quarter more than that of 1936. Inorganic chemicals are to increase by 18 per cent to the 1936 output and will have a value of 180 million marks. These plants will be working at only three-quarters of their capacity. The largest group—miscellaneous chemicals (including explosives) will increase by 45 per cent nearly up to the 1936 figure, 1066 million marks compared with 1095 million. Although this is only slightly below the pre-war production level it is obviously well below (38 per cent) the existing capacity of the plant Organic chemicals up by 18 per cent will go to the 1936 figure—160 million marks, while dyestuffs although increasing by 50 per cent will be slightly lower in value at 173 million (1936—180 million), pharmaceuticals increasing by only 5 per cent will be 228 million (1936—270 million) and tar distillation up 97 per cent, lower at 63 million marks compared with 75 million in 1936. Chief rise in exports is to come, however, from the steel industry which is to increase by 135 per cent over the March 1946 plan. The cement industry too, is to increase by 43 per cent. No change is apparently being proposed in the arrangements made under the previous plan in regards to ball bearings, synthetic rubber, and synthetic petrol and oil

Dwindling Oil Resources

SOME interesting facts relating to world petroleum reserves and the possibility of large-scale production of oil fuel supplies by synthesis were disclosed by an American scientist, Dr. Kirtey F. Mather, when he addressed the British Association at Dundee last week. Speaking on " Petroleum today and tomorrow." Dr. Mather pointed out that petroleum was now being used at such a rate in relation to its total amount in the earth's crust that its complete exhaustion, from a geological viewpoint, was alarmingly imminent. It was probably a conservative estimate that the world's oil production would average more than 3,000,000,000 barrels a year during the next decade. Such figures he thought began to take on real significance when the most recent estimates made by competent petroleum geologists gave a figure slightly less than 70,000,000,000 barrels for proved world

reserves. But it would be far too simple and quite erroneous to announce that the world's oil would be exhausted in 23 years, because the proved reserves were only a fraction of the actual reserves.

Although an intensive search for new oil-fields had been made in the United States and proved reserves were still increasing, there was little doubt, according to Dr. Mather, that the peak would be reached by 1950. Thereafter new finds would descend towards zero. This gloomy forecast was the inevitable stop for every oil-producing region in the world. Faced with the prospect of increasing demands and dwindling supplies, petroleum geologists, engineers, and economists must employ every weapon in the arsenal of science and technology to meet the situation.

Alternative Supplies

To help meet this, an appreciable fraction of American requirements was being met by the synthesis of liquid hydrocarbons from natural gas. Another alternative supply from abundant materials was oil from coal. If known techniques for producing oil from coal by chemical synthesis were applied to the coal reserves of Great Britain alone there would be sufficient petroleum for all British requirements for at least a few hundred years. As yet, however, Dr. Mather thought the equipment was far too costly and complicated for production on a sufficently large scale to permit a substitution of mineral fuel in the immediate future.

Not Good Enough

THESE are hard times for Britain, as indeed they are for most countries, hence our wholehearted acceptance of the principle of "exporting until we bust." Why then, is it, that the Industrial Wales Exhibition fails to impress? We should have thought that no effort ought to have been spared to attract buyers from all quarters of the globe.

Wales and Welshmen are known and liked the world over just as much for their native language and their quaint intoned rendering of English as for their Celtic customs of hard work and loyalty to a cause. The coalfields of Wales have been supplying coal to world markets for many decades—in fact until 1934, Wales was synonymous with coal. But in that year, Viscount Portal, then Sir Wyndham Portal, went there as an independent investigator to discover what could be done to relieve the industrial depression and consequent unemployment in the Principality. Following the publication of his report, great industrial developments took place. Tin-plate manufacture, oil refining, the production of chemicals and consumer goods for home and overseas quickly sprang into being, until the area assumed an importance comparable to that of the Midlands, the North-East and North-West.

At this stage of its development, therefore—austerity or no austerity, crisis or no crisis—careful and well-prepared plans should have been drawn up at least twelve months in advance. Publicity abroad might well have been intensified with Government backing through the medium of such bodies as the British Council. Guides and interpreters ought to have been promised, and such ordinary expressions of hospitality as hotel accommodation and social entertainment guaranteed at reasonable prices. Instead of the Board of Trade being a mere exhibitor it should have been a co-sponsor—or better still, the sole sponsor. There is, in fact, no excuse for ministries or government departments wasting taxpayers' money by exhibiting at a show which is to a large extent expected to attract buyers from overseas.

We think too, that for workmen to be seen putting finishing touches to stands on the day following the opening of an exhibition, is not the best way to create favourable impressions in visitors' minds. There can be no question of shortage of materials or of labour. This exhibition, and for that matter any exhibition at this period of British history, must be accorded priority rights. If British products exported abroad are to put this country first on a solvency basis, then on the road to a measure of prosperity, no obstacle must be allowed to stand in the way of success of such exhibitions as that of Industrial Wales. As it is, we fear there may be a distinct possibility of disappointing results.

Price Control of Fertilisers

The Board of Trade announces that under the Control of Fertilisers (No. 35) Order 1947, the charge which may be made for sulphate of ammonia and sulphate and muriate of potash, where delivery is in bags containing less than 2 cwt., is increased as from September 1, 1947, from 6s. 6d. per ton to 8s. per ton.

INDUSTRIAL WALES EXHIBITION

THE industrial capacity and prowess of Wales is strikingly portrayed at the Industrial Wales Exhibition which opened at Olympia on Thursday last. It is to remain open until Saturday, September 13, and visitors are admitted each day (except Sunday) between the hours of 11 a.m. and 9 p.m. Sponsored and organised by the Industrial Association of Wales and Monmouthshire, the exhibition may be regarded as the first major step the Association has taken to implement the 16-point pledge accepted at its inaugural meeting on April 11, 1947.

Following an official luncheon, at which Sir Gerald Bruce (the organisers' president) took the chair, the Rt. Hon. Viscount Portal performed the opening ceremony.

The chemical, chemical engineering and metallurgical industries are well represented by such firms as W. A. Baker & Co., Ltd.; British Celanese, Ltd.; British Nylon Spinners, Ltd.; British Gas Council; the Elephant Chemical Co., Ltd.; Guest Keen Baldwins Iron & Steel Co., Ltd.; Imperial Chemical Industries, Ltd.; Monsanto Chemicals, Ltd.; National Oil Refineries, Ltd.; and Patrol Polishes, Ltd., the Board of Trade, Ministry of Supply, and National Coal Board also have impressive stands.

On the occasion of our representative's first visit, he was not over-impressed by the attendance, though some firms reported they had received a number of important and optimistic inquiries both from home and overseas buyers. Certainly there is much to see and learn, and no doubt Pledge No. 2 of the Association—"To promote the goodwill of Welsh craftsmanship and to see that the industrial products of Wales find their rightful place in the markets of the world"—will be well on the way to realisation by the time the exhibition closes next week-end.

Meanwhile, and finally, a word of praise for the National Coal Board. Its working model of a pit-head, complete with screens, "tumbler," "shaker," conveyor belts and wagons, deserves full marks.

Canadian Paints

Sales of paints, varnishes and lacquers by manufacturers in Canada which normally account for 96 per cent of the total Canadian production, amounted to $6,706,917 in May, compared with $6,624,964 in April, and $5,945,465 in May, 1946, according to figures issued by the Dominion Bureau of Statistics. Sales for the five months ending May totalled $29,830,340 compared with $25,156,294 for the same period of 1946.

CHEMICAL EXPOSITION IN NEW YORK

IN an interview with our New York representative last week, E. K. Stevens, associate manager of the 21st Chemical Industries Exposition, which is scheduled to open in New York at the Grand Central Palace on December 1, told him that all available space has already been taken and that all quarters of the industry have shown widespread interest. The exhibition will offer a greater show of chemicals than ever before and, apart from the fact that there have been an increased number of inquiries for space, a greater number of former exhibitors have made application for more space than hitherto.

Processing Equipment

The display of processing equipment will be more comprehensive than usual, and it is expected that many new developments will be disclosed. Raw and fabricated materials, standard mill units, such as valves and piping, shafting pulleys, belts, clutches and couplings, transmissions, conveyors, motors, pumps, will be shown in great variety.

Chemical plant and chemical processes will be of interest to visitors from almost every branch of productive activity. The integration of chemistry is so widespread in industry to-day that equipment suitable for some part of almost every kind of manufacturing plant will be found in the list of exhibits. Against a background of machinery and manufacture, the Chemical Exposition, famed for its revelation of the latest products of research and development in the field of chemistry, will picture the remarkable progress of the past few years.

Among those who will form an advisory committee for the Exposition are: Raymond F. Bacon, consulting chemist; Wallace Cohoe, president of the Chemists' Club; J. V. N. Dorr, president of the Dorr Company; J. E. Ferris, president of the Salesmen's Association of the American Chemical Industry; George W. Heisse, president of the Electrochemical Society; W. Albert Noyes, president of the American Chemical Society; W. T. Read, General Staff, U.S. War Department; Charles M. A. Stine, president of the American Institute of Chemical Engineers; and E. R. Weidlein, director, Mellon Institute, Pittsburgh, Pa.

As in the past, only accredited visitors will be admitted to the Exposition, and sightseers and the general public will be excluded, thus ensuring better attention and more complete opportunities for members of the trade to study the exhibits and make their inquiries.

CEMENTS RESISTANT TO SEA WATER

Experiments by Italian Professor

INTERESTING experiments are being conducted at the University of Pisa in Italy by Professor Gino Gallo who is endeavouring to devise a formula for cements that would resist the deleterious action of sea water. It is a well-known fact that ordinary Portland cements disintegrate rapidly in sea water owing to the formation of small needle-like crystals of sulpho-aluminate of calcium which cause increase in bulk and the consequent cracks.

Professor Gallo has sought to overcome this trouble by replacing the oxide of calcium in cements by oxide of barium, as the sulphate of barium which would form in such a case is insoluble. His first experiments were conducted with three barium silicates: monobarium silicate (BSi), bibarium silicate (B_2Si) and tri-barium silicate (B_3Si), which were made by mixing intimately pure silica and carbonate of barium. The materials were subjected to a temperature of 1500°C. in a Tamman furnace for about half an hour. The resulting product was ground finely and passed through a sieve of 4900 meshes per sq. c. The powder was next mixed with water and subjected to a setting test by means of a Vicat needle. The resulting samples were placed to mature in ordinary water and in water containing 1 per cent of sulphate of magnesium.

The results were as follows: (a) the monobarium silicate did not set at all; (b) the bi-barium silicate set in 30 minutes and developed heat. The samples immersed in ordinary water gave place to the phenomenon of hydrolysis and tended to disintegrate. On the other hand, the samples placed in 1 per cent solution of sulphate of magnesium formed a superficial stratum of sulphate of barium, preserved well, and displayed good resistance to pressure; (c) the tri-barium silicate set in 10 minutes, and developed considerable heat. The samples crumble in ordinary water, and preserve well in water containing sulphate of magnesium.

Professor Gallo next proceeded to test a mixture of 71 per cent tri-barium silicate, 7 per cent of bi-barium silicate and 22 per cent of tri-barium aluminate. This mixture set in 20 minutes and the samples not only resisted well in sulphated water but crumbled more slowly in ordinary water.

The last set of experiments was conducted with various mixtures of silica, alumina, oxide of iron and carbonate of barium, which are subjected to heating at 1500°C. for half an hour. One of such products composed of 76 per cent of tri-barium silicate (B_3Si) and 24 per cent of B_4Al gave excellent results. The setting started 40 minutes after mixing with water and lasted 1 hour 50 minutes. The samples behaved very well not only in sea water but also in fresh. Professor Gallo has kept some of them in ordinary water for over a year, and being protected by their thin stratum of carbonate of barium, they show no signs of crumbling.

Professor Gallo feels he is on the right track and it only remains for him to determine the quantity of barium oxide necessary for the protection of cement before achieving complete success.

OFFICIAL NOTICES

Magnesium Order Revoked

With effect from September 1, the Ministry of Supply has made an Order (The Control of Magnesium (No. 5) (Revocation) Order, 1947) revoking the Control of Magnesium (No. 4) Order, 1942. The acquisition, disposal, and use of all forms of magnesium and magnesium alloys has thereby been removed from licensing and price control. Supplies of magnesium will in future be distributed by F. A. Hughes & Co., Ltd., who will sell pure metal to all United Kingdom consumers without restriction at 1s. 2d. a pound delivered.

Control of Penicillin

Consequent upon the coming into effect of the Penicillin Act, 1947, on July 18, and the Therapeutic Substances Amendment Regulations, 1947, on August 18, the Ministry of Supply has made the Control of Penicillin (No. 3) (Revocation) Order, 1947 (S.R. & O. 1947, No. 1831). This Order, which became effective from August 30 last, frees penicillin and penicillin preparations from control by the Ministry of Supply. As from that date, licences granted under the Control of Penicillin (Nos. 1 and 2) Orders, 1946, have ceased to have effect.

While it is no longer necessary for firms wishing to manufacture penicillin preparations to obtain the approval of the Ministry of Supply to their acquisition of bulk penicillin, firms desiring to manufacture preparations for injection will need to apply to the Licensing Authority under the T.S.A. 1925 for a licence.

The effect of the Penicillin Act is that penicillin and its preparations may be supplied and administered to the public only on the prescription of a qualified medical practitioner, dentist or veterinary surgeon.

CHEMISTRY AND THE COLONIES*

by J. L. SIMONSEN, D.Sc., F.R.S.

OUR meeting can best be regarded as a continuation of that so abruptly terminated in 1939, and I appreciate greatly the honour of being asked to be the president of this section. Dundee early showed its interest in the British Association, and it is just 80 years ago since it first enjoyed the city's hospitality. On that occasion Professor Anderson was the president of this section. When next we met here, in 1912, Professor Senior gave a discourse on the nature and method of chemistry. Much of what he then said is true to-day.

Addresses from this chair have in the past concerned themselves with a variety of themes. Some have been devoted to a consideration of the more outstanding contributions to chemical knowledge during the previous twelve months, others to some branch of our science which the president has made more peculiarly his own, but, so far as I can discover, the application of the scientific method to the solution of the many problems of our Colonies has not so far been discussed. In attempting to do this I hope to interest a wider public than might be the case if I had chosen one of only scientific importance.

On this occasion the subject would appear to be particularly appropriate since just a year ago two important conferences were held in London, the Royal Society Empire Scientific Conference and the Official Commonwealth Scientific Conference. Many of the resolutions approved at these conferences, if they are, as we may hope, implemented cannot fail to influence profoundly not only the future of this country and the Dominions but also of our Colonies. Success can, however, only be achieved if there is the fullest co-operation not only in research but also in the utilisation of the results of such research.

Problems of the Empire

It may not be unfruitful to look for a short time into the past and to trace the beginnings of the application of science to the varied problems of the overseas Empire. To get a true picture we must bear in mind that many of the now self-governing members of the Commonwealth were at that time Crown Colonies and that within their territories there was little industrial development. They were regarded essentially as sources of raw materials for the mother country. Furthermore, it was not considered a function of government to engage or even support, except by small grants, scientific research. It was only during the First World War that governments first realised that their active participation was necessary, and this resulted in the formation of the Department of Scientific and Industrial Research. The work of this great organisation is too well known to require any elaboration by me. We have now parallel bodies in the great Dominions and in India.

An important landmark in the application of science to the colonies was the foundation in 1883 of the Imperial Institute, a national memorial to the jubilee of Queen Victoria. In the first issue of the *Bulletin* of the Institute (May 1, 1903), the functions of the Institute were stated to be: "The principal object of the Institute is to promote the utilisation of the commercial and industrial resources of the Empire by arranging comprehensive exhibitions of material products, especially of India and the Colonies, and providing for the collection and dissemination of scientific technical and commercial information relating thereto."

Imperial Institute Studies

I do not propose to give a detailed account of the work of the Institute or of its vicissitudes. It will suffice to record that the necessity for research on colonial products was fully recognised by its first Director, the late Sir Frederick Abel and by his successor, Sir Wyndham Dunstan. Laboratories were provided and much original research was carried out in them, while the collaboration of other investigators was obtained. I would mention in particular the valuable studies on the natural colouring matters which we owe to the late Professor A. G. Perkin, whose materials were largely supplied by the Institute. Possibly the most valuable of the earlier activities of the Institute was the organisation of geological surveys in the African colonies and the assistance which it gave to the growing of cotton in the Empire. Unfortunately, the work of the Institute has always been handicapped by the lack of adequate financial resources and in recent years original research has no longer formed a part of its activities. It has, however, continued to be a main centre for the collection and dissemination of scientific, technical and commercial information. The great importance for such a centre was emphasised at the meetings of the Royal Society Conference, and this subject, as you are doubtless aware, received strong support from this Association. It is obvious that whatever form the reorganisa- of the Institute may take in the future, this

* Presidential Address to the Chemistry Section of the British Association for the Advancement of Science at the Dundee meeting.

activity is likely to prove of increasing importance.

It has during recent years become clear that if the Colonies are to be developed and play their full part in the world's economy, they can no longer continue to be regarded solely as prime producers. While it is recognised that agriculture, with its essential feature the growing of foodstuffs, must continue to be the main industry of the Colonies, as indeed is true also for many of the Dominions, the introduction of other industries is essential. While the development of these in their early stages is dependent mainly upon the application of known processes, their future progress will require research of a high order, and this is especially true of agriculture, which must be highly efficient, since it is not improbable that this will provide the main source of their industrial raw materials.

Colonial Products Research Council

In spite of the major preoccupations of war the government in this country gave careful consideration to these colonial problems, and they rightly reached the conclusion that only with the assistance of science and the men of science could they be solved. In 1942 the Colonial Products Research Council was formed, and it held its first meeting in January, 1943. It may not be without interest to record here a part of its terms of reference:

"To review the field of Colonial production and to advise what colonial raw materials are likely to be of value to the manufacture of intermediate and other products required by industry; in consultation with the Director, to initiate and supervise researches, both pure and applied, on such products, and generally to consider how, by the application of research, greater use can be made of them."

While the term "raw materials" in the terms of reference, if interpreted in its full sense, includes minerals, animal and vegetable products, I propose to confine my remarks more especially to the last, since a consideration of the first two subjects would take me into fields of science upon which I do not feel competent to address you. With regard to minerals it will suffice to say that in the future economy of many of the colonies they are likely to play a predominant part. Much now depends upon a detailed geological survey, still so sadly lacking, and so far as the African Colonies are concerned upon the full utilisation of the admirable facilities available in the Union of South Africa for experiments on their processing.

As raw materials for the chemical industry plant products can be of two kinds, primary products such as sucrose (sugar), vegetable and essential oils, or secondary (waste) products, bagasse, straw, shells of nuts. We must for the provision of these depend upon two important factors, water and an efficient system of agriculture. Perhaps, not unnaturally, we in this country are not sufficiently water-minded, but we must recollect that the Colonies are in the greater part situated in the tropics. In many of them water is not too abundant and a systematic survey is required, not only of its availability for irrigation but also as a source of hydroelectric power. I would suggest also that it might prove profitable to study in how far some of the saline water from inland lakes could be rendered suitable for irrigation by the use of resin filters.

In making a survey of the plant products of the Colonial Empire it is at once apparent that the most abundant of these are the carbohydrates, starch and sugar. Any large scale chemical industry based upon plant products must look to these for their basic raw materials. Starch already finds an extended application in industry and it differs considerably in its properties depending upon its source. New uses are also likely to be developed. The elegant methods evolved in the Birmingham laboratories for the separation of the two constituents, amylose and amylo-pectin, have rendered these readily accessible products. Amylose resembles cellulose closely in its properties and could doubtless for many purposes replace this. We know very little of the nature of the starches present in the starch-producing plants of the tropics, and a survey of them is urgently required. Preliminary investigations in this direction are in progress, but in view of the importance of the subject they need to be considerably extended. The work is tedious and it can be carried out only in the territories where the plants occur. We cannot assume that other starches with properties as unique as those of arrowroot will not be found.

Sucrose

When we turn to sucrose we find that in the past, apart from its use as a foodstuff, its industrial application has been confined almost solely to the fermentation industries. In addition to its utilisation for manufacture of alcoholic beverages, industrial alcohol and other solvents, it is now a source of many important acids. Much consideration has been given to the possibility of using carbohydrates for the manufacture of power alcohol or similar products for use in internal combustion engines. This may prove possible to a very limited extent, but the cost of power from such materials would be prohibitive and the area required for the cultivation of the necessary plant products could ill be spared from that required for the growing of foodstuffs. Here, in parenthesis, I would mention that, should the cost of molasses rise too greatly, it is doubtful if they can compete as a source of alcohol

with ethylene from the gases resulting from the cracking of petroleum. This is especially true since the methods for the manufacture of alcohol and other chemicals from ethylene and also from acetylene have been greatly improved.

Enormous Production

It is somewhat remarkable that although sucrose is the organic chemical produced in a pure state on the largest scale of any in the world, until recent years very little attention has been directed to the possibility of utilising it as a raw material for the chemical industry. Active work with this object in view is now in progress both in this country and in the United States. We are fortunate that for many years this country has led the world in the study of the chemistry of the carbohydrates and, taking advantage of this, the Colonial Products Research Council has, since 1943, had a team working at Birmingham on this fundamental problem under the direction of Professor Sir Norman Haworth and Dr. L. F. Wiggins. The sucrose molecule is complex and we do not expect rapid or spectacular results, but some progress has been made. In one derivative of sucrose, levulinic acid, we have a substance which in the form of its sodium salt is an excellent antifreeze, superior in many respects to ethylene glycol. From this acid also compounds have been prepared which show promising chemotherapeutic properties. Other derivatives of sucrose may find application in the plastics industry. The processes required for the prepartion of some of these substances are comparatively simple and could be carried out readily in the territories in which the sugar cane is cultivated. This would undoubtedly cheapen their manufacture since research has shown that in many cases the crude cane juice can be used in place of the crystallised sucrose. We may anticipate that in a few years sugar will once more be produced in quantities far in excess of that required for nutritional purposes, and by that time our knowledge of the new developments referred to above, and probably others, will be sufficiently advanced to enable them to be developed on an industrial scale.

I do not propose to bore you with an account of the other investigations which are being carried out on Colonial products but there is one activity of the Colonial Products Research Council to which I must refer. During the course of a short visit which Sir Robert Robinson and I made to the Caribbean in 1944 we were impressed by the important part which microbiology might play in the development of the economy of the West Indies and also of the other Colonies situated in the tropics. Microbiology has, in this country, been a Cinderella among the sciences, and its importance has only come to be fully recognised with the discovery of penicillin and the other valuable antibiotics now being studied so vigorously. Facilities both for the training of microbiologists and for research in this subject are in this country somewhat limited. With the recognition of its importance to the Colonies the Colonial Products Research Council decided to open a Microbiological Research Institute in Trinidad. This will, I believe, be the first research institute in the British Commonwealth dealing solely with the subject, and it will have as its first director Dr. A. C. Thaysen, whose work in this field is well known. As chemists we are accustomed to associate this science mainly with the fermentation industries, but the flavour of our tea, cocoa and tobacco is dependent largely also upon the action of microflora. It is possible also that the fusarium, responsible for the Panama disease which attacks the banana, may be open to biological control. An actino mycete, first isolated in the West Indies, has been found to destroy this fusarium, and it is now being actively studied from both the biological and chemical aspects jointly by Dr. Thaysen and by Dr. A. H. Cook and his collaborators in Sir Ian Heilbron's laboratory.

Soil Fertility

We can anticipate also that this Institute may be able to assist in the solution of some of the difficult problems associated with soil fertility. Recent research is providing evidence that the polysaccharides, resulting from the action of the soil microflora, play an important part in the formation of the soil humus. Is it too optimistic to anticipate that this joint biological and chemical attack on the conditions present in the soil may provide new methods for the prevention of the impoverishment of the soils so widespread in the Colonies? It is intended that this research institute shall be a centre for microbiological research not only for the Colonies but for the Commonwealth as a whole.

During the course of our survey of the colonial plant products our attention was not unnaturally directed to the very large number of plants to which medicinal properties have been attributed. In some cases the reputed action of the plant is religious in its origin, in others such action as they may have, is due to the presence of tannins or mineral salts, but there remain many which require further investigation. Synthetic organic chemistry, with its attention to chemotherapy, has replaced many drugs previously obtained from plants. I need only mention the antimalarials, more especially paludrine. This new drug, probably the greatest contribution of British chemistry in the field of chemotherapy and one

which may revolutionise life in the tropics, is due to Dr. F. H. S. Curd and Dr. F. L. Rose and their collaborators working in the pharmaceutical laboratories of Imperial Chemical Industries, Ltd. In my opinion the special merit of their achievement is that they have broken away from tradition. Unlike previous synthetic antimalarials, paludrine has no structural resemblance to quinine. It would appear to be highly improbable that quinine can any longer be regarded as the drug of choice in the treatment of malaria. Such progress does not, however, in my opinion, diminish the necessity for a further study of the constituents of the plants with which medicinal properties have been associated. The application of the modern technique to this problem should make it a fruitful field of research both for the chemist and the pharmacologist. Investigations of this character will not only be of interest to the structural organic chemist but may be of assistance also to the taxonomist.

Oils from Grasses

My attention was first directed to the latter possibility during my investigations on the constituents of the essential oils derived from the cymbopogons. These grasses are difficult for the systematic botanist to identify although they can be readily differentiated by the constituents of their essential oils. For example, the two grasses, *Cymbopogon Martinii* Stapf (var. *motia*) yielding palmarosa oil is indistinguishable in the herbarium from *C.Martinii* Stapf (var. *sofia*), which yields a ginger grass oil of little value. Since the two oils have very different constituents they can, however, be readily characterised in the laboratory.

Some years ago I ventured to suggest that comparative chemistry might be used to assist the taxonomist, and this possibility has been discussed in two sectional presidential addresses to this Association. In 1929, Barger expressed the view that chemistry was likely to be of little value to the systematic botanist. He recognised that it had proved of use in the classification of the lichens and of the eucalypts, but he was unable to trace any connection between chemical structure and botanical classification in the case of the alkaloids. The subject of chemical constituents and taxonomy was considered in much greater detail by Hill in 1930 at the Bristol meeting of the botanical section. He recorded many instances where comparative chemistry had been of great assistance to the systematic botanist. In spite of the respect which I have for any opinion expressed by so great an authority as Barger, my own view is unchanged. The investigations of British chemists have in the past made great contributions in this field. We have the classical work of Baker and Smith, so ably continued by Penfold on the eucalypts. They have traced a relationship between the venation of the leaves and the constituents of their essential oils. A determination of the latter enabled them to define the species, and their classification of the eucalypts is essentially one based upon chemistry. Even wider in its scope has been the work of Sir Robert and Lady Robinson on the anthocyanins. The elegant and delicate methods of analysis which they have developed has made their work not only of value to the systematist but also to the geneticist, and I do not doubt that with a return to normal times we shall see it utilised to a much greater extent. Finally, I would refer to Hilditch's researches on the constitution of the glycerides in the animal and vegetable oils and fats. My views have received strong support in a recent publication by Darnley Gibbs. He has provided conclusive evidence that the botanist can no longer disregard the nature of the chemical constituents in his classification of plants. If, however, chemistry is to be in a position to afford this assistance, a refinement and simplification of our methods of analysis is necessary. The possibility of this is well illustrated by the work of the Robinsons.

The chemist cannot only be of assistance to the botanist but also to the zoologist. Already Ford has shown that in the case of butterflies the classification based upon morphology corresponds with the chemical character of their pigments while Munro Fox has shown that the difference in their hæmoglobins can be used to differentiate the several species of the crustacean genus daphnia. I would direct attention also to the important results obtained recently by Erdtmann in his detailed study of the constituents present in the wood of conifers and in pine needles. From these he has isolated substances showing marked fungicidal properties. We may well inquire if these are natural timber preservatives. Erdtmann has further found that many geraniol derivatives act as fungicides. We shall look forward with interest to the continuation of this work.

Colonial Flora

I would suggest that considerations of this character would alone warrant a detailed study of the rich flora of our Colonies even if we do not thereby find new products of economic value. But one further and no less important branch of research may profit from a more detailed study of plant constituents. We are still in the main ignorant of the part which they play in the plant metabolism. We have, it is true, some knowledge regarding the carbohydrates and fats but little definite information regarding the essential oils and alkaloids, although Robinson's theory as to the mechan-

ism of the formation of the latter is undoubtedly correct. It is possible that a successful attack on problems of this nature may now prove possible by the use of isotopes. Only when we are fully cognisant of the part which the plant constituents play in the plant economy can agriculture be placed upon a really sound scientific basis.

In concluding this brief and, I fear, somewhat disconnected survey of some of the many problems relating to the application of science to the Colonies, I must refer to one aspect of primary importance, and one upon which its success must in large measure depend, namely, the health and well-being of the peoples. It is but a platitude to say that the health of a people depends upon an adequate supply of nutritious food and upon the prevention of disease. Both are dependent upon science and in neither respect can the conditions in the Colonies be viewed with complacence. Chemistry can play a major part in their improvement but only if it is used on an adequate scale, as our experience during the war has shown. Our scientific efforts should, in my opinion, be applied first to these fields.

Foodstuff Loss

If we are to have an adequate supply of food, it is, of course, obvious that we must have an efficient system of agriculture, but this will be of little gain if, after the crops are harvested, we lose much of them by pest infestation. It has in the past been too little realised how great is the loss of foodstuffs by insect, fungoid and rodent attack. It is estimated that, of the annual crops of cereals, oil seeds, beans, etc., some thirty million tons a year are lost in this way or, in other words, there is an average total loss of some 3 to 5 per cent of the world's food production. The loss naturally varies in different countries, in Canada it is about 1 per cent, but in Kenya the loss of maize may be as much as 10 per cent and in East Africa about one-third of the total production is lost in this way. These figures suggest that improved methods of agriculture together with the prevention of soil erosion will have little effect if we do not at the same time prevent this loss. Fortunately, we are acquainted with methods which can do much to mitigate it if they are scientifically applied. We can reduce the moisture content of grains before they are stored, we can see that adequate storage accommodation is available, we can see that it is free from insect infestation prior to storage and inaccessible to rodents.

Deinfestation

Deinfestation before storage can be effected with various chemicals, but unfortunately many of these are also toxic both to man and animals. In some cases, for example hydrogen cyanide and methyl bromide, the toxicity is very high, but we know how to overcome any risks which may be attached to their use. The toxicity of the newer and most valuable insecticides, gammexane and DDT is apparently very low and it is doubtful if they involve any danger to man in the quantities usually employed. Unfortunately accurate knowledge on this point is still lacking and it will require long term experiments to determine whether they can act as cumulative poisons. Until such evidence is available it is obvious that their use in direct contact with foodstuffs cannot be permitted. This may appear to be an ultra-cautious attitude to adopt, but the recent work of Mellanby on the cause of dog hysteria justifies it. It is disturbing to find that this is caused by the ingestion of flour bleached by a well known and widely used method. Dare we assume in the absence of similar evidence that the continued consumption of small quantities of these new insecticides may not expose us to danger? If on further investigation these insecticides are found to be safe and non-toxic we shall have a weapon which should largely prevent loss of foodstuffs by insect attack.

Control of Disease

Of even greater importance than the prevention of the loss of food is the control of insect-borne diseases of man and beast which so seriously undermine their health and which render large areas of the Colonies uninhabitable. The field operations in Burma and elsewhere have proved conclusively that a large measure of control is possible, and it is doubtful otherwise if the campaigns in these tropical areas could have been fought with success. Our two foremost enemies are undoubtedly the mosquito and tsetse fly. Since Sir Ronald Ross' epoch-making discovery that the mosquito was responsible for the transmission of malaria and the subsequent proof that it was responsible also for yellow fever, large-scale measures for its control have been successfully undertaken. These measures cannot, however, be generally applied, and I believe that a new era has now arrived by the discovery of the new synthetic insecticides. Admittedly we have still much to learn as to their method of application but the experiments carried out during the war and since its termination have given results of the greatest promise. I would venture to suggest that we have already sufficient knowledge to enable us to eradicate the mosquito from isolated areas. If applied on an adequate scale it should prove possible by their use to eliminate completely the mosquito from islands, such as Cyprus, Trinidad and Mauritius, without in any way affecting the beneficent insects. The financial cost would be comparatively small and negligible

compared with the gain in health and efficiency of the inhabitants. The control in Continental areas affords greater difficulty, but the results obtained by Symes and his co-workers in British Guiana and Uganda have already indicated that the problem is not insoluble. In spite of certain views to the contrary, it seems to be proved that the internal and external spraying of the houses in towns and villages with suitable solutions of the insecticides, owing to their lethal and residual effect, does result in a pronounced fall in the mosquito count and this must inevitably result in a diminution in the risk of infection. It should not be forgotten that at the same time other transmitters of disease, flies and lice, will also be killed. It is essential that the various problems involved in the use of these insecticides should be vigorously attacked in a bold and imaginative manner. Simultaneously we should not overlook the possibilities of the prophylactic and curative uses of paludrine and other medicinals and of the insect repellants such as dimethyl phthalate. If the co-ordinated attack on malaria, which is now possible, meets with success, which I believe it will, life in the tropics will be revolutionised, and science will have made another notable contribution to colonial prosperity.

Tsetse Fly Control

A problem of far greater complexity is involved in attempting the control of the tsetse fly, the transmitter of trypanosomiasis. While we know that a partial measure of control does result from a clearing of the bush the method is far too laborious and expensive to be applied over the vast areas which are involved. We know also that the fly can be killed by insecticides if brought into contact with them, but we do not know how this can best be done. The evidence at present available suggests that a solution may be found in insecticidal smokes applied either directly from aeroplanes or by smoke bombs dropped from them, but much further research is required. We must be prepared to attack this problem on a scale commensurate with its magnitude and the cost will be heavy. We should be encouraged to undertake this, however, when we see the success achieved against that major agricultural pest, the locust, by the combined use of gammexane baits and dinitro-*o*-cresol.

I have attempted most inadequately to show the part which science can play in the development of our Colonies and in the improvement of the health and prosperity of their people. For the man of science the opportunities are great, equally great are his responsibilities. He will not fail if he receives from the administration the support to which he is entitled.

Notes from Brazil

THE Conselho Nacional de Petroleo, Rio de Janeiro, announces the discovery of a new oilfield at Dom Joao, in the Sao Francisco do Conde area of the State of Bahia. Results so far obtained in that locality are considered excellent, the first two wells drilled being reported to have respective daily outputs of 300 and 700 barrels.

Tenders have been received by the Conselho from several U.S. concerns for the erection of a refinery in the State of Bahia, with a daily capacity of 2500 barrels, to process local crude oil. A Bill is now before Brazil's Congress proposing that this refinery should be operated by an organisation to be styled Refinaria Nacional de Petroleo A.A. with a capital of 50 million Cr., one-half to be subscribed by the Government and the remainder by the public.

Bottled Gas

The Companhia Nacional de Gas Esso, a subsidiary of the Standard Oil Company, was recently formed for the purpose of distributing bottled gas throughout Brazil. A report from New York stated that the first shipment, consisting of 100,000 gallons of propane gas, is now en route to Rio de Janeiro. A similar product, imported from Argentina, has been marketed in Brazil since 1937 by the Cia. Ultragaz S.A. for domestic and industrial purposes.

Scientific and Technical Research in Japan

Approximately two-thirds of the 3951 research projects undertaken in Japan during the last six months were in the field of applied science, the remainder being in fundamental science (excluding work in medical schools and hospitals), states Report No. 19, issued by the Supreme Commander for the Allied Powers. Most of the 180 laboratories engaged in applied science were commercial, Government-operated, or independent laboratories not connected with the Universities. Chemical technology, with 35 per cent of all projects in applied science, was the largest single field of endeavour; it was followed by agriculture and forestry, electrical technology, mechanical technology and metallurgy. Shortage of equipment and materials, however, seriously hampered research work and kept its general quality fairly low. Emergency problems of short-range importance, such as saccharification and salt production, received much attention and special emphasis was also placed on research for new sources of food and on substitutes for soap-making ingredients.

American Chemical Notebook

From Our New York Correspondent

President E. F. Bullard of the Stanolind Oil and Gas Company (a subsidiary of the Standard Oil Company of Indiana this week, announced that a long-term contract has been concluded between Stanolind and the U.S. Industrial Chemicals Company, Inc., calling for the sale of all the water-soluble oxygenated chemicals that will be produced at the first two synthetic gasoline and oil plants using the much publicised Fischer-Tropsch process. The plants are being undertaken by the Stanolind Company and the Carthage Hydrocol Corporation, and plans also call for the erection of two United States Industrial Chemicals plants for the production of other products using some of the Fischer-Tropsch chemicals as raw materials.

It is estimated that the chemicals produced from these Fischer-Tropsch plants may exceed a total of 300,000,000 pounds annually, and include ethyl alcohol, methyl alcohol, normal propyl alcohol, normal butyl alcohol, normal amyl alcohol, acetone, methyl ethyl ketone, acetic acid, propionic acid, butyric acid, acetaldehyde, propionaldehyde and butyraldehyde. In addition, United States Industrial Chemicals will produce esters, higher alcohols and other chemicals from some of the primary products which will add substantially to the number of products made available by this development.

It is said that the larger quantity of organic chemicals which will be made available through the new process will mean a dependable source for much needed chemicals at prices competitive with those from any other synthetic or fermentation process. The larger quantity of important chemicals available, United States Industrial Chemicals claims, will stimulate the development of new solvents, plasticisers, pharmaceuticals, plastics and other chemical products.

* * *

The U.S. Department of Agriculture last week announced an emergency export allocation of 3000 short tons of linseed oil which had been acquired by the Commodity Credit Corporation from Argentina. This oil will be re-exported by the present commercial holders, and is in addition to the 8250 long tons announced on August 7. These re-exports are from the two recent purchases made by the Commodity Credit Corporation of 32,000 and 40,000 tons, respectively. The 3000 tons announced this week will be re-exported as follows: Phillipines, 1000 tons; Australia, 650 tons, Czechoslovakia, 100 tons; Belgium, 750 tons, and Netherlands, 500 tons.

Production of most inorganic chemicals in the United States continues at a high level with the output of many of them above that of a year ago, L. L. Horch, New York regional director of the United States Department of Commerce, declared last week on the basis of the department's August "Chemicals and Drugs Industry Report." The report cited improvement in the persistent alkali shortage and predicts that next year's output will be ample to meet requirements.

The domestic demand for bichromates has slackened, and practically all needs have been fulfilled. Other conclusions reveal that industrial requirements for nitrogenous compounds are also being met without difficulty. Phosphatic compounds, however, are still in short supply, particularly the sodium phosphates which require alkalis for their manufacture. Sodium sulphates are in short supply, but sulphur and sulphuric acid orders are being met. The report anticipates a brighter outlook for coal tar crudes, record production of acetone, acetic acid and many other non-cyclic organic chemicals, larger fertiliser sales and an eased situation on insecticides. Paint sales continue high with prices generally unchanged.

* * *

From September 1, the chemical division of Koppers Co., Inc., started production of sulphuric acid at its new plant recently erected at Kearny, New Jersey, adjacent to the company's Seaboard coke plant. Ronald Barraclough, manager of the new plant states that in addition to the production of sulphuric acid, hydrogen cyanide manufacture will commence sometime in October while other related chemicals will be produced next year. When the new plant is in full operation it will be capable of producing some 21,000 tons of sulphuric acid and 1,200,000 pounds of hydrogen cyanide per year.

According to Mr. Barraclough, sulphuric acid will be produced from hydrogen sulphide recovered from coke-oven gas produced by the adjacent Seaboard plant and from crude brimstone, and while the plant is a separate entity of the chemical division, it will be closely integrated with the Seaboard plant. Hydrogen sulphide, for sulphuric acid production, will be obtained by hot vacuum activation. This removes hydrogen sulphide from the crude gas, both purifying it and obtaining materials for the sulphuric acid production.

CHEMICAL PRODUCTION JAPAN

PRODUCTION of chemicals in Japan increased during March because of improved deliveries of coal and lignite, and the relaxation of restrictions on the use of electric power, states Report No. 19, issued by General MacArthur's headquarters. Output of basic chemicals is given as 31 per cent of estimated requirements for a balanced economy, *i.e.*, an increase of eight per cent over the February level.

Output of ammonium sulphate had reached a post-war peak of 63,987 metric tons, amounting to 85 per cent of present capacity. Increased calcium carbide deliveries led to a 35 per cent rise in the output of calcium cyanamide. However, the production of 13,237 metric tons fell short of the planned output because most factories had low fuel stocks. Insufficient deliveries of pyrites to phosphate plants in the early part of the month resulted in a serious shortage of sulphuric acid for superphosphate production. Later in the month, however, pyrite deliveries were given the same transport priority as coal and coke, with the result that 110,726 metric tons of sulphuric acid were produced during the month—a record.

Imports of common salt amounted to 57,667 metric tons, while 11,562 metric tons were produced locally, total supplies being equal to only 48 per cent of requirements. Increased production of electrolytic caustic soda, soda ash, hydrochloric acid and liquid chlorine are reported, but total supplies still cover only a fraction of requirements. An increase in the supply of coal-tar products can be attributed to more extensive coking activities and a further increase is expected because several plants were to start scrubbing coke gas in April. Crude benzene output exceeded that of February by 27 per cent.

In the dyestuffs field, production of sulphur black and khaki colours, of which considerable stocks are available, decreased in March, and raw materials were diverted to the manufacture of dyestuffs required for textile exports. Output of direct and acid dyestuffs exceeded the February level by about 25 per cent. However, output of acetylene derivatives declined.

Italian Fertiliser Output Up.—Output of nitrogenous fertilisers in Italy totalled 1,686,000 quintals in the first half of this year, compared with 1,422,000 quintals in the second half of last year and with only 754,000 quintals in the corresponding period of 1946. It is hoped that this year's output will aggregate about 3,500,000 quintals.

SULPHURIC ACID PRODUCTION IN S. AMERICA

AN increasing output of sulphuric acid may conveniently be taken as a yardstick for the development of any country's heavy chemical industry. According to recent reports reaching London, output of sulphuric acid in South America is at present about twice as high as before the war. The major countries, both as regards production and demand, are Argentina, Brazil and Mexico. Before the war, total requirements amounted to about 100,000 tons, of which 97 per cent had to be imported. Output for 1946, however, amounted to nearly 200,000 tons and it is reported that the capacity of plants planned, or actually in course of construction, totals 250,000 tons. For instance, a well-known Belgian chemical group is to erect plants in Argentina where, in addition to sulphuric acid, other industrial chemicals, such as ammonia, ammonium nitrate and nitric acid are to be manufactured. The country's output totalled 66,840 metric tons last year, and when three further plants are completed (in the Mendoza, Cordoba and Santa Fé Provinces) output will be doubled.

Four New Plants for Brazil

In Brazil, the manufacture of sulphuric acid is concentrated in the Sao Paulo area, but there are two plants in other parts of the country. Four additional plants, working on the contact process, are planned, one of which is to supply an oil refinery in Rio Grande do Sul with the necessary sulphuric acid, while a second plant is to supply a rayon factory. The delay in the shipment of equipment from the United States, however, has caused a considerable slowing down of the erection of a plant near Volta Redonda, but it is hoped to complete it in the second half of 1948.

In Colombia, there are two plants, one at Medellin, and a more recent one at Barranquilla, with a combined output of over 9000 metric tons. There is one plant in Peru, and should an electrolytic zinc plant, for which plans are in hand, be eventually erected, output of sulphuric acid (which would be derived as a by-product) would be increased. In Montevideo, Uruguay, there is one chamber plant, with a contact plant under construction, to produce 15 tons a day.

Mexico, which has seven factories producing at a rate of 32,500 tons a year, could increase output to nearly 60,000 tons. Should oil refining operations increase now that settlement of the long-standing nationalisation dispute has been reached, a better utilisation of the existing sulphuric acid manufacturing capacity might be expected.

Chemicals from Farm and Forest

Recent Progress in Chemurgy

IN *Chim. et Ind.* 1947, 57(5), 431-440 (May), H. T. Herrick, of the U.S. Department of Agriculture, presents an interesting, illustrated account of the industrial utilisation of waste and surplus products, mainly from the farm, but equally applicable to those derived from forests and fisheries. In its widest sense, chemurgy would seem to comprise the working up by chemical or other means of any material derived from these sources, but more specifically it applies to waste, surplus, or inferior material unsuitable for direct use. Its early history in the U.S.A. dates from about 1862, when attempts were made to utilise surplus crops of fruit, such as grapes, for wine production. During subsequent periods of agricultural depression it has provided additions to the farmers' income as well as proving a useful source of raw material for the chemical and allied industries.

Money for Research

A considerable amount of work along these lines had been accomplished in various research establishments before 1938, but in that year progress reached its consummation in the allocation by Congress of 4 million dollars to the Department of Agriculture, for chemurgical research, including new regional experimental stations at Peoria (Illinois), New Orleans, Philadelphia, and Albany, near San Francisco. The Peoria establishment included two laboratories already in existence, namely, the Soya Bean Products Laboratory (1936) and the Farm By-Products Laboratory at Ames, in Iowa (1931). In each of the four new buildings a large amount of space was allocated to equipment for work on a semi-manufacturing scale, so that reliable data could be obtained as to actual factory methods and costs. Herrick says that considerable progress has been made, partly stimulated by the exigencies of war which made it still more necessary to concentrate on practical and realistic ends.

The principal results obtained are summarised under the following heads: farm residues, lucerne, animal fats and oils, apples, cereals, cotton, fruits, skins, leathers and tanning materials, dairy products, oilseeds, groundnuts, egg products, sweet potatoes, tobacco, vegetables and potatoes. From these is obtained a wide and varied range of products such as paper material, xylose (wood sugar) and lignin, together with derivative chemicals from straw, sugar cane, bagasse, etc. From maize stalks and rice waste, valuable preparations for removal of deposited carbon and oil from aircraft engines have been obtained. A considerable amount of so-called lucerne flour is now prepared from the legume of that name. Animal fats, such as lard and tallow of lower than edible grade, are now largely used in the manufacture of synthetic rubber and, of course, also for soap and lubricants. Apples unfit for direct use are being increasingly employed for production of a syrup "miel de pomme" to the extent of 4000 tons of the "honey" per annum; also for manufacture of pectin and *fruits glacés*.

Use of Cereals

Cereals not required for foodstuffs are used in the manufacture of starch and alcohol. Cotton already has a number of new applications, including more particularly that of tyre cording, special types of surgical bandages and of fireproof cotton articles. Under the heading of fruits (waste and surplus), particular reference is made to Velva Fruit, another type of *fruits glacés* for which there is said to be increasing demand. In the work on skins, leathers and tanning materials a primary aim is that of discovering other sources of tannin to augment or replace the normal sources which have been seriously affected by insect attack. Among dairy products the most important are casein and lactose. More than 3000 tons of the latter are now employed in the manufacture of penicillin, and quite large quantities are also used in producing the elastomer Lactoprene, lactic acid, etc. A special kind of silk is now made from casein.

Oleaginous Crops

The principal oleaginous crops in the U.S.A. are cotton-seed, linseed, soya bean and groundnuts. Acreage under the two latter has been enormously increased in recent years. The already numerous products of the soya bean are being improved, and new ones developed, attention being particularly directed to the use of the oil for paints and varnishes and as a rubber substitute. Groundnut flour, a cold-setting glue, gummed paper, and water paints are also being improved.

Research on tobacco mainly relates to nicotine and preparation of new and more effective insecticides. Large quantities of special starch—up to 25,000 tons per annum in one works—are now made from sweet as well as ordinary potatoes. Work on dehydration of these and other vegetables forms an important part of the programme.

A CHEMIST'S BOOKSHELF

Modern Advances in Inorganic Chemistry. By E. B. Maxted. Oxford University Press, London. pp.vi + 296. 20s.

It is a regrettable but inevitable consequence of the advance of science that one can no longer keep abreast of all developments in the field of chemistry by merely following the literature. Nowadays, it is necessary to have summaries, produced by workers in the field, to give a broad grasp of the growth and the present state of the various branches in essentially non-specialist fashion. The digesters, if one may so refer to them, have a function which is almost, if not equally as important as the primary producers.

The work under review puts before us a selection of topics from the field of inorganic chemistry. The first chapter, which is a comprehensive, physical introduction to atomic and molecular structure, deals with the ultimate particles of matter, and shows how they bear on the structure of the nucleus. After a brief discussion on the history of the electronic structure of the atom, the author deals with the quantum mechanical views of the structures of the different atoms before proceeding to the bonding and formation of molecules, both from the theoretical and practical points of view. All these matters have to be grasped before one can become conversant with the newer work on inorganic chemistry.

Hydrogen, which has always stood as an element apart, has a chapter to itself. Atomic and molecular hydrogen receive attention first, followed by a detailed account of deuterium and its compounds. A reference to tritium concludes the chapter. The recent chemistry of the halogens consists primarily of a discussion on the oxides of the halogens, and the interhalogen compounds—hafnium, rhenium and masurium—are considered at some length.

On the physical side, some space is devoted to the behaviour of gases in discharge tubes, some attention being paid to the reactions which may occur there as a result of the existence of atomic gases or free radicals. This leads up to a consideration of the preparation and uses of artificially radioactive elements. As this is nowadays a common newspaper topic, it is useful to have an *authoritative* account of work in this field. The subject is, indeed, an obvious candidate for inclusion in any work on modern inorganic chemistry, as is also the last chapter on uranium and the trans-uranic elements. The published information on this last subject (if one ignores the mass of material which has appeared in the popular press) is, unfortunately, still meagre, so that this chapter, through no fault of the author, is by no means as full as one could have wished.

The author may be criticised for his apparent acceptance of the existence in nature of tritium and masurium. If the author feels he can accept these two claims on the published evidence, then he should in all fairness point out that there is a strong body of opinion holding the contrary belief. The late Lord Rutherford was incisive in his remarks on the natural occurrence of tritium; and while he may have been wrong, theoretical considerations suggest strongly that if artificial radioactive H^2 can be produced (and on this point there seems little doubt) then a stable natural H^3 is not probable.

As for masurium, it seems incredible that its development has not kept pace—even in tortoise-and-hare fashion—with that of rhenium, if it occurs in the concentrations claimed by the Noddacks. Consequently the reviewer is content to follow Perrier and Segre, and to call the element *technetium*.

These are relatively minor criticisms of a work which is commendably up-to-date, especially when one bears in mind the rapid and comparatively recent advances in some of the branches with which it deals. The book is very readable, and the publishers continue to uphold their reputation for the production of books of good value and great worth.

Asbestos in Italy

In spite of the fact that large quantities of asbestos have been imported into Italy by U.N.R.R.A., the situation remains precarious. It is difficult to use the imported asbestos as it is made up of very short fibres. Local production cannot be relied upon, for the two mines existing at Val d'Aosta and at Valtellina yield only small quantities and no increase can be hoped for. The demand on the other hand is constantly increasing as fireproof tubing, cloth and panels are badly needed in various fields and the building industry also has its demands. There is no other remedy except to import a suitable quantity of good quality asbestos.

Home News Items

U.S. Coal Arrives in London.—A cargo of 9000 tons of coal from the U.S. arrived in the Thames last week in the collier *Coulbeg*. It was discharged at Swanscombe and at Purfleet for commercial use.

Mining Survey.—A survey now being undertaken by mining engineers in the Strontiam district of Ardnamurchan, North Argyllshire, will include the extensive workings of the lead mines which have been closed for more than a hundred years.

Electrodeposition Conference.—Under the auspices of the Electrodepositors' Technical Society, an International Electrodeposition Conference is to be held at the Hyde Park Hotel, from September 17-19. An exhibition illustrating recent developments in electrodeposition research and practice will be on view at the hotel during the conference.

Strain Gauge Demonstration.—Representatives of the technical Press, after being entertained to lunch by the directors of Vauxhall Motors, Ltd., at the Hungaria Restaurant on Tuesday last, witnessed a demonstration of a strain gauge with which the company has been carrying out extensive research and development work at its Luton establishment.

New Latex Company.—Under the auspices of Harrisons and Crosfield, a new company is to be registered in Malaya for the purpose of organising the collection of latex and providing buildings and plant for its concentration. The capital will be provided by companies associated with the above mentioned firm and operations are planned to commence before the end of next year.

Sub-surface Coal Operators.—Miners working with modern equipment will shortly produce 500 tons of good quality coal daily from a worked-out outcrop coal site at Essington, near Cannock, Staffs. Opencast methods had to cease when the seam became too deep to work. Two one-in-five gradients will be tunnelled, and a conveyor belt will bring the coal direct to the surface where it will be screened and mechanically loaded into lorries.

Engineering and Marine Exhibition.—The Engineering and Marine Exhibition was officially opened on Thursday of last week by Mr. Chuter Ede, the Home Secretary. The exhibition will close on September 13. Speakers at the inaugural luncheon were Mr. A. V. Alexander, Lord Dudley Gordon, and Lieut-Col. H. Riggal. Overseas visitors were later entertained to dinner under the presidency of Lord Dudley Gordon, speeches being made by Mr. C. Bentham and Mr. W. H. Kitson.

Skip Winding at Lancs. Colliery.—Skip winding equipment successfully installed at a new seam of Astley Green Colliery, is expected to raise weekly output from 9000 to 14,000 tons.

F.B.I.'s Note to Prime Minister.—The Federation of British Industries has addressed a communication to the Prime Minister recommending steps to be taken to deal with the economic crisis.

Paraffin and the Dollar.—Of the 172 million gallons of paraffin imported over the six-month period ending June 30 last, only 32 million gallons came from the U.S., said Mr. Shinwell last week. The remainder came from the West Indies it was disclosed.

Coal-Saving Furnaces.—When the first of several furnaces being converted by the Cargo Fleet Iron Co. (Middlesbrough) to oil burning comes into operation soon, there will be a weekly saving in coal consumption of 300 tons. Each furnace is said to consume about 250 tons of fuel oil a week.

Photography Exhibition.—The Institute of British Photographers is holding an exhibition at 74 South Audley Street, London. It opened on Thursday last, and visitors will be admitted daily (except Sundays) from 9 a.m. to 7 p.m. until September 30.

Mobile Atomic Energy Exhibition.—Two L.M.S. railway coaches which until recently housed a mobile penicillin exhibition, are now to be used for an exhibition of atomic research and experiment. Organised by the Atomic Scientists' Association and the Ministry of Supply, the exhibition will tour many Yorkshire industrial centres early next year.

OFFICIAL NOTICE

Washing Soda Prices

The Board of Trade, after consultation with the Central Price Regulation Committee, have now withdrawn the cash maximum prices formerly fixed for washing soda, and prices will now be subject to the Prices of Goods Act, 1939. This is affected by the Washing Soda (Maximum Prices) (Revocation) Order, 1947, and the Prices of Goods (Price Regulated Goods) Order, 1947 (b).

The effect is that traders, including manufacturers, will henceforth be allowed to exceed their 1939 selling prices only by such extent as is justified by increases in defined costs. This change takes effect as from August 27, 1947.

Personal

SIR FREDERICK BAIN, a deputy chairman of I.C.I., and president of F.B.I., who is at present in Australia on I.C.I. business having previously visited Canada and the U.S.A. on F.B.I. affairs, and who has been away from this country since May last, is returning on September 13.

DR. E. TALBOT PARIS, Ministry of Supply radar expert, received the American Medal of Freedom with bronze palm at the American Embassy last week. The accompanying citation refers to "meritorious service during the war in the field of scientific research development."

MR. LENNOX BERTRAM LEE has resigned his directorship of the Calico Printers' Association having as recently as June 30 retired from the chairmanship after 39 years in that office.

MR. T. E. WALLER has been appointed deputy district manager of Dunlop's Nottingham depot to which he has been attached since he left his post of tyre inspector with the Ministry of Supply last year. He has been with Dunlop since 1912 and first came to Nottingham as service representative in 1928.

MR. H. J. ROSS is to become deputy chairman of the board of the Distillers Company, and MR. L. A. ELGOOD is to be chairman of its management committee. MR. A. F. MCDONALD is to be the company secretary, and MR. J. F. DEMPSTER the deputy secretary.

MR. JAMES BRUCE LEASK has become a director of Harrisons & Crosfield, the appointment having effect from Monday last. Mr. Leask has been actively associated with the company for the past 27 years having recently retired as chairman of Harrisons & Crosfield (Malaya).

MR. N. F. STOCKBRIDGE has been appointed a director of Vauxhall Motors.

MR. CHARLES YOUNG has been appointed a director of Hardman & Holden, Limited, and will be responsible for all sales matters.

MR. C. K. F. HAGUE, managing director of Babcock & Wilcox, and MR NOEL CARRINGTON, a director of Royle Publications, have received Board of Trade appointments as additional members of the Council of Industrial Design.

MR. H. F. OPPENHEIMER has been appointed a director of Rhodesia Copper Refineries in succession to Mr. W. D Wheeler who has resigned.

The weaving supervisor of British Celanese, who with Dr. Illingworth and Mr. Eyre has been elected a Fellow of the Textile Institute (as mentioned in the Personal column of THE CHEMICAL AGE last week), is MR. J. L. F. MCDOWELL.

Obituary

MR. ANDREW JOLLIE, who was a director of United Steel Companies, and until quite recently the chairman of the parent company—Steel, Peech & Tozer—died last week at Edinburgh. Until March of last year he was also chairman of the National Association for Rolled and Re-rolled Steel Products, of which he was one of the founders.

SIR HAROLD KENWARD, a director of Dunlop Rubber Co., Ltd., who was on his way to North America last week to visit the company's plants at Toronto and Buffalo, died suddenly on the *Queen Elizabeth* in mid-ocean.

MAJOR J. S. BAKER, a director of Baker Perkins, Ltd. and a past chairman of that company, has died in the U.S. where he was negotiating with the American Baker Perkins Company. Major Baker, who was 66, was the grandson of the company's founder.

DR. DAVID JONES, one of the foremost authorities on mining and metallurgy in the country, was killed last Saturday evening in a road accident between Amesbury and Durrington. Dr. Jones, who was 48, was recently appointed to the Chair of Mining at Birmingham University after 11 years as head of the mining department at Cardiff. He was made a C.B.E. this year.

Coal Price Increase

Commenting on the increase in coal prices on August 25, Sir Andrew M'Cance, joint managing director of Messrs. Colvilles, Ltd., in an interview, stated that so far as his firm was concerned this would increase the cost of production by a corresponding amount, and as Britain's costs were already high compared with costs elsewhere, it was bound to affect our ability to export. It was the result of the five-day week and other concessions to the miners. The rest of the country had to pay for it.

Referring to the estimated current loss of 3s. 9d announced by the National Coal Board, Sir Andrew added that that was almost certain to happen. Anyone who knew anything about coal mining realised it was inevitable because of the decreased output per man. All these things were not unexpected. They were the fruits of nationalisation.

SIR HENRY TIZARD, has been elected president of next year's annual meeting of the British Association to be held at Brighton.

Overseas News Items

Malayan Tin Output.—Malayan output of tin and tin-in-ore at 75.5 per cent in July totalled 2520 tons.

The Solexol Process.—The Baltimore plant of Lever Brothers Co. is expected to be in production this autumn, employing the Solexol process for refining fats and oils.

Russo-Indian Chemical Trade. — To develop trade in fertilisers, chemicals and dyestuffs between Soviet Russia and India, an Indian delegation is to go to Russia.

Canadian Casein Output Up.—According to official Canadian statistics, output of rennet and acid casein rose from 1,679,000 lb. in the first half of 1946 to 2,622,000 lb. in the first half of this year.

Indian Shellac Exports Down.—India's shellac exports declined in July to 6506 packages, against nearly 12,000 packages in the previous month. Seedlac shipments, on the other hand, rose from 5330 to nearly 8750 packages.

German Chemical Plant for Britain.—According to a statement by the Inter-Allied Reparation Agency of Brussels, Great Britain has received a chemical and physical laboratory from the Dusseldorf plant of Haniel and Lueg.

French Rayon Price Increase.—Prices of all kinds of artificial silk in France have been increased by order of the French Price Administration. Viscose rayon has risen from Frs. 139.30 per kilo to Frs. 167.25, and viscose staple fibre from Frs. 83.85 to 90.10.

German Chemical Developments.—The Wolfen chemical plant in the Soviet Russian zone is reported to be engaged in the manufacture of Mersol, a detergent intermediate of which about 12,000 tons is expected to be produced this year, as compared with only 3000 tons in 1946.

Kenya Pyrethrum Market Conditions.—Kenya pyrethrum growers are reported to be anxious regarding the future of pyrethrum, fearing that after the end of the current year, the price may represent a loss to the grower. Some farmers are already said to be reducing their acreages, retaining only high-toxic plants.

U.S. Linseed Substitute.—Because of the excessive price for linseed oil, demanded by Argentina, the U.S. has successfully evolved a substitute product, being a mixture of tung and soyabean oils. This has lead to a noticeable change in the supply position and it is reported that licences have already been granted for the export of 5900 tons of U.S. linseed oil stocks.

French Chemicals for Poland.—Chemicals are included in a list of goods to be sent to Poland in exchange for 1,000,000 tons of coal.

U.S. DDT Output.—The present production rate for DDT in the United States is about 50,000,000 lb. per annum, a figure somewhat higher than present demand.

New Chemical Plant in Chicago.—A new plant has recently been completed in Chicago by the Gliddon Corp. for the production of soya sterols to be used in the manufacture of sex hormones.

Imports Prohibited.—A supplementary list of commodities just issued by the Chief Controller of Imports, New Delhi, includes glass substitutes, micarta sheets, pyrotechnic aluminium powder, and plastic manufactures.

New German Lignite Mining Company.—A new company, the Seligenstaed A.G., has been formed in Gera, U.S.S.R. zone of Germany, with a capital of 100,000 marks, to exploit recently-discovered lignite deposits in the town's neighbourhood.

Prospecting in Pakistan.—The Government of Pakistan is to inaugurate an extensive programme of oil, coal and iron prospecting in the Dominion as part of a plan to start up essential industries at present non-existent.

British Guiana to Cut Imports.—With a view to assisting Britain over her present financial difficulties, British Guiana is to cut imports from all sources, and at the same time increase exports of bauxite, gold, sugar and timber.

Spain/Sweden Trade Pact.—A new trade agreement between Spain and Sweden provides for the mutual interchange of products to the value of 43 million Swedish crowns on each side. Approximately two-thirds of Spanish purchases will consist of chemical wood-pulp.

Zeiss Works to Make Microscopes Again.—It is reported that the Zeiss Works in Jena are to resume the manufacture of microscopes at the end of this year. The number of employees is to be increased simultaneously by 1000 to 6000. The 1939 figure was 7000 operatives.

French Steel Combine.—The two leading French steel concerns—Denain et Anzin and Nord et L'Est—have combined for the purpose of pushing a steel modernisation programme in France. A 15 million-dollar order for equipment has already been placed with United Engineering & Foundry Co.'s plant at Youngstown.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *— followed by the date of the Summary, but such total may have been reduced.)

SCRIVENS LTD., Birmingham, manufacturing chemists. (M., 6/9/47). July 22, £1460 mortgage to Birmingham Citizens Permanent Building Society; charged on 53 Rymond Road, Ward End, Birmingham. *Nil. January 16, 1947.

BRITISH ALUMINIUM CO. LTD., London, E.C. (M., 6/9/47). July 30, disposition by W. N. Craig with consent granted in implement of a Trust Deed dated September 12, 1934; charged on land with cot. known at Ourequay, and other erections thereon at Burntisland. *£3,135,559. April 11, 1947.

NORTH BRITISH ALUMINIUM CO. LTD., London, E.C. (M., 6/9/47). August 1, Trust Deed dated July 30, 1947, securing £3,500,000 3 per cent deb. stock of British Aluminium Co. Ltd., and premium of 1 per cent; charged on deb. stock and shares, properties, set out in schedule to Deed and general charge (subject to &c.). *——. Mar 25, 1947.

Company News

The name of **Morris Ashby Smelting Co., Ltd.**, 10 Philpot Lane, London, E.C.3., has been changed to Deanshanger Oxide Works, Ltd., as from August 1, 1947.

The Staveley Coal and Iron Company has acquired the whole of the shares in Beswick's Limeworks, Limited, of Hindlow, near Buxton.

The name of **Vocalzone Company Ltd.**, chemical manufacturers, etc., 12 Lammas Street, Carmarthen, has been changed to Vocalzone Limited, as from August 7, 1947.

The nominal capital of **Morhams, Ltd.**, manufacturing chemists, etc., Torquay, has been increased beyond the registered capital of £100 by £9,900, in £1 ordinary shares.

Yardley & Co., soap and perfumery manufacturers, is to sub-divide the ordinary £1 shares into one ordinary share of 4s .and four "A" ordinary shares of 4s. each. Present issued capital is £363,810 including £289,080 of ordinary £1 shares.

The nominal capital of **Kelro Chemical Co., Ltd.**, 23 Crabb Street, Rushden, has been increased beyond the registered capital of £2000, by £8000, in £1 shares.

The nominal capital of **Cambrian Chemical Industries, Ltd.** (formerly Chemical Sales, Ltd.) 9 Victoria Street, London, S.W.1., has been increased beyond the registered capital of £200, by £4800, in £1 shares.

The Calico Printers' Association has announced a net profit for the year just ended of £407,237, compared with £313,611 last year, and has recommended payment of a dividend of 5 per cent, less tax, on the ordinary stock.

The nominal capital of **British Drug Houses, Ltd.**, 16-34 Graham Street, London, N.1, has been increased beyond the registered capital of £1,325,000, by £925,000, in 225,000 non-redeemable preference shares of £1 and 2,800,000 ordinary shares of 5s.

The nominal capital of **Hess Products, Ltd.**, manufacturers of and dealers in fats and oils, chemical and other substances, etc., 26 Park Row, Leeds, 1, has been increased beyond the registered capital of £32,500 by £12,500 in £1 ordinary shares.

Midhurst White, manufacturers of fertilisers and bricks, although paying no interim, is maintaining its dividend at 10 per cent for the year. Net profit amounted to £10,500 as against last year's figure of £14,300.

Beralt Tin and Wolfram is paying a dividend of 25 per cent on the £331,000 capital for the year to March 31 last, also an interim dividend of 20 per cent on account of the year to March 31, 1948. For 1945-46 a dividend of 10 per cent having been distributed in respect of each of the preceding six years.

Chemical and Allied Stocks and Shares

WITH the Government's crisis plans being announced in instalments, stock markets reflected continued uncertainty, prices in most sections falling back further, moderate selling having a marked effect, the volume of business declining, and buyers being extremely cautious. Owing to prevailing uncertainties, weakness of industrial shares was in sharp contrast to a further rally in British Funds which were in better demand with 2½ per cent Consols and Treasury Bonds showing a further rally on balance. Marking down of industrials was indiscriminate and chemical and allied shares again reflected the prevailing trend.

Imperial Chemical were down to 41s. 9d., and now yield over 4¾ per cent on the basis of last year's 10 per cent distribution which it is generally assumed should be maintained

unless there is another serious fuel crisis in the winter. Moreover, the market believes that in due course I.C.I. £1 units are likely to be split into four of 5s. each. Reflecting the general tendency, Monsanto Chemical declined to 48s. 9d. Fisons were again 60s. and both B. Laporte and W. J. Bush were 90s., but Glaxo Laboratories further declined to £15½. Lawes Chemical 10s. shares were 14s., Major & Co.'s 2s. ordinary 3s. 3d., Greeff-Chemicals Holdings 15s., and Borax Consolidated were 49s. 4½d. United Molasses were down to 40s. Dunlop Rubber only 62s. 9d., and Levers 46s. 9d. Associated Cement were lowered to 60s., and British Plaster Board to 23s. 6d.

Despite the bumper results, the units of the Distillers Co. receded to 128s. 6d.; the impending consolidated accounts are expected to show exceptional strength. British Glues and Chemicals 4s. shares have remained steady at 19s. 6d., General Refractories were 21s. 6d., Amalgamated Metal 16s. 6d., and Imperial Smelting 18s.

Textiles were unresponsive to the 5 per cent dividend announced by Calico Printers —the first dividend on the ordinary shares for sixteen years. Calico Printers were 19s. 9d. with Bradford Dyers 20s. 6d. and Bleachers 10s. 4½d. Courtaulds at 43s. regained part of an earlier decline. Iron and steels were subdued earlier in the week, influenced by T.U.C. nationalisation discussions. Stewarts & Lloyds were 45s. 9d. Dorman Long 23s. 9d., United Steel 23s. 6d., and Colvilles 24s. 6d., while Tube Investments were £5 ⅛, and elsewhere, British Aluminium went back to 41s., and British Oxygen to 87s. 6d. Although lower on balance, movements in the electrical equipment section were relatively moderate, General Electrical being 84s. 6d., English Electric 52s., and Associated Electrical 73s. 9d. Gas Light & Coke were 20s. 4½d., and other gas stocks were also little affected by the view that a Bill for nationalisation of the industry may be announced during the next session of Parliament.

Boots Drug went back to 54s. 6d. reflecting the general set-back in shares of companies with large stores interests. Timothy Whites at 39s. 6d. were also lower with Beechams deferred down to 21s. Elsewhere, Wall Paper Manufacturers deferred fell to 41s., and paint shares reflected the decline in building and allied shares which were affected by fears of slowing down in the housing programme. Pinchin Johnson were 52s. 9d., and Goodlass Wall 33s. 1½d. Oil shares showed considerable uncertainty, falling back after news of the decision to abolish the basic petrol ration, and failing to rally after the increase in the price of petrol. Sentiment in regard to the big oil groups was affected by the French decision to limit imports of oil. Mexican Eagle advanced from 14s. 4½d. to 21s. 3d., following news of the settlement terms with the Mexican Government.

British Chemical Prices

Market Reports

PRESSURE for supplies has been the main feature in the market for industrial chemicals during the past week, and the movement in the aggregate has been fairly substantial. The volume of inquiries for overseas destinations has also been well maintained but actual bookings for export, so far as the scarce items are concerned are unavoidably restricted by the priority requirements of the home-consuming industry. Chemicals for the textile industry and paint raw materials have been in active request and delivery specifications, it is understood, are being met with reasonable promptness. No special section of the market calls for comment, the price position throughout continuing on a very firm basis, and against the background of recent costs there appears to be little likelihood of any change in the position in the immediate future. The output of coal-tar products is being fully absorbed and a fair-sized export trade has been met, notably in creosote, cresylic acid and naphthalene.

MANCHESTER.—Holiday influences on the Manchester chemical market have again been less in evidence during the past week, and the call for contract deliveries of textile and other industrial chemicals has been on fairly steady lines. There have also been plenty of new inquiries about for home users and for shippers, and additions to order books in most of the leading products have been reported. In the fertiliser section the demand, on the whole, has been no more than moderate. There is a brisk call for most of the tar products, quotations for which are on a very firm basis.

GLASGOW.—In the Scottish chemical market shortage of Glaubers and soda crystals has been much accentuated by the hot weather which has again made crystallisation difficult. Demand for these materials and trisodium phosphate has been heavy. There has been no improvement in the supply position of any material worth recording. Such materials as acetone and trichlorethylene have been in fair demand as has also petroleum jelly. There has been the usual steady demand over the normal range of industrial chemicals and deliveries against orders for most materials have been reasonably prompt. In the export market there has been a tendency for prices to increase, due to the rise in cost of packaging. Inquiries have been on a fair scale, but chiefly for chemicals which are not available. Offers of caustic soda at fantastic prices have been reported from several sources.

Patents in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of specifications accepted may be obtained from the Patent Office, Southampton Buildings, London, W.C.2., at 1s. each.

Complete Specifications Open to Public Inspection

Method of producing thiolactams.—Bata, Narodni Podnik. November 16, 1942. 16843-44/1947.

Process for preparing hydroxylaminosulphonate solutions.—Bata, Narodni Podnik. November 25, 1943. 16845/1947.

Resinous compositions comprising amino-formaldehyde condensation products.—British Industrial Plastics, Ltd. January 12, 1946. 37586/1946.

Processes for the production of riboflavin.—Commercial Solvents Corporation. March 16, 1942. 16418-19/1947.

Processes for the recovery of riboflavin.—Commercial Solvents Corporation. May 28, 1943. 16420-21/1947.

Process of removing hydrogen sulphide from hydrocarbon liquids.—Girdler Corporation. March 12, 1943. 16702/1947.

Esters of beta-halo carboxylic acids and methods of preparing same.—B. F. Goodrich Co. October 5, 1945. 26440/1946.

Coating compositions.—I.C.I., Ltd. November 25, 1944. 31827/1945.

Device for producing toxic vapours.—I.C.I., Ltd. September 11, 1945. 27291/1946.

Quaternary ammonium halides and methods for obtaining the same.—Parke, Davis, & Co. January 11, 1946. 8033/1946.

Quaternary ammonium halides and methods for obtaining the same.—Parke, Davis, & Co. January 11, 1946. 8034/1946.

Quaternary ammonium compounds and methods for obtaining same.—Parke, Davis, & Co. January 11, 1946. 8035/46.

Method and means for self agglomeration.—Soc. Chimique de la Grande Paroisse Azote & Produits Chimiques. January 9, 1946. 38154/1946.

Processes for the recovery or regeneration of waste sulphuric acid and mixtures containing same.—Spilek Pro Chemickou a Hutni Vyrobu. October 26, 1940. 16821/1947.

Processes for the recovery or regeneration of waste sulphuric acid and mixtures containing the same.—Spolek pro Chemickou a Hutni Vyrobu. September 29, 1943. 17079/1947.

Processes for the recovery or regeneration of waste sulphuric acid and mixtures containing the same.—Spolek pro Chemickou a Hutni Vyrobu. October 9, 1944. 17220/1947.

Contacting finely divided solids and gaseous fluids. Standard Oil Development Co. September 12, 1941. 15307/1942.

Improvements in the conversion of fluid reactants in the presence of subdivided solid catalyst particles.—Universal Oil Products Co. September 29, 1945. 15920-21/1947.

Alkylation of paraffin hydrocarbons.—Universal Oil Products Co. December 31, 1938. 16880/1947.

Purified antibiotics and process of obtaining same.—Wyeth, Inc. January 9, 1946. 36980/1946.

Preparation of substituted *N*—(Aromatic (b) pyrazmethyl) aminophenyl compounds and intermediates thereof.—American Cyanamid Co. January 15, 1946. 13481-82/1946.

Resinous compositions.—American Cyanamid Co. January 19, 1946. 32660-61/1946.

Carbonisation of coking coals.—American Cyanamid Co. January 16, 1946. 643/1947.

Reduction of organic compounds.—British Celanese, Ltd. September 27, 1945. 28238/1946.

High clarity cellulose esters.—British Celanese, Ltd. January 17, 1946. 37531/1946.

Preparation of tetrahalogenated benzenes and benzoic acids.—British Celanese, Ltd. January 1', 1946. 1288/1947.

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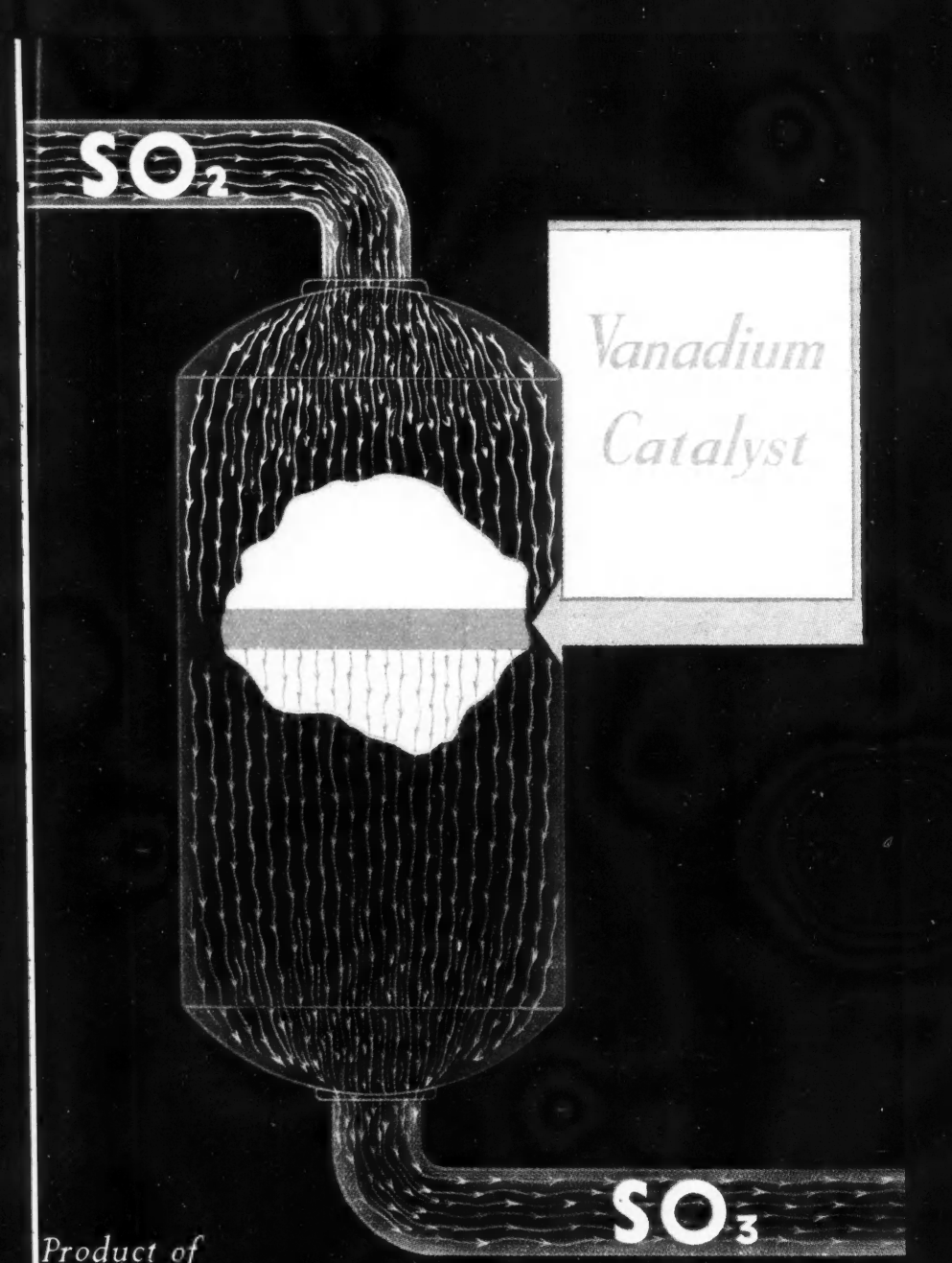

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